Naval Facilities Engineering Command, Southwest
Contracts Department
1220 Pacific Highway, Building 127, Room 112
San Diego, California 92132-5190

CONTRACT NO. N68711-04-D-1104
CTO NO. 0010

FINAL

GROUNDWATER MONITORING REPORT
UST SITE 14121

August 21, 2006

MARINE CORPS BASE
CAMP PENDLETON, CALIFORNIA

DCN: SES-TECH-06-0155

Prepared by:

SES-TECH

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ABBREVIATIONS AND ACRONYMS

amsl	above mean sea level
CTO	Contract Task Order
DEH	Department of Environmental Health
EPA	U.S. Environmental Protection Agency
ft/ft	feet per foot
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
MCB	Marine Corps Base
mg/L	milligrams per liter
NAVFAC SW	Naval Facilities Engineering Command, Southwest
QC	quality control
RPD	relative percent difference
SES-TECH	Sealaska Environmental Services LLC and Tetra Tech FW, Inc.
TPH-d	total petroleum hydrocarbons quantified as diesel
UST	Underground Storage Tank
Water Board	California Regional Water Quality Control Board

1.0 INTRODUCTION

This Groundwater Sampling Report, prepared by SES-TECH, a joint venture between Sealaska Environmental Services LLC and Tetra Tech FW, Inc., presents the results of groundwater sampling completed in June 2006 at Underground Storage Tank (UST) Site 14121 at the Marine Corps Base (MCB) Camp Pendleton, California (Figure 1-1).

UST Site 14121 is regulated under the California State Water Resources Control Board Leaking UST program as administered by the California Regional Water Quality Control Board (Water Board, formerly RWQCB), and this analysis was conducted in support of efforts to achieve regulatory site closure. The document guiding the assessment, remediation, and closure process for the site is the *San Diego County Site Assessment and Mitigation Manual 2004* (San Diego County Department of Environmental Health [DEH], 2004). This groundwater sampling event is the first of four consecutive quarterly events to be completed to help support site closure. The four quarterly sampling events are required by the Water Board as described in a letter dated September 21, 2005 (reference SMC: 50-3293.05: peurp). The groundwater sampling activities conducted at the site, as well as the associated reporting activities, were performed under Contract Task Order (CTO) No. 0010 for the Naval Facilities Engineering Command, Southwest (NAVFAC SW), Contract No. N68711-04-D-1104.

1.1 SCOPE OF WORK

Groundwater monitoring at UST Site 14121 includes measuring water levels and collecting and analyzing groundwater samples. As requested by the Water Board in the September 21, 2005, letter, all four wells at the site were sampled for total petroleum hydrocarbons quantified as diesel (TPH-d). In addition, one well was sampled and analyzed for total heterotrophic plate count and total diesel-degrading bacteria.

1.2 SITE IDENTIFICATION

Site identification data:

Site Address:	Building 14121, 14 Area, MCB Camp Pendleton, CA 92055
Facility Name:	Logistics Modernization Team Offices
Water Board Case No.:	9UT3293
DEH Case No.:	H05939-250
Property Owner and Responsible Party:	United States Marine Corps
Contact Person:	Mr. Chet Storrs, Remediation Branch Manager Assistant Chief of Staff, Environmental Security Building 22165, Box 555008 MCB Camp Pendleton, California 92055-5008 (760) 725-9774
Remedial Project Manager:	Mr. Bipin Patel NAVFAC SW 1220 Pacific Highway San Diego, CA 92132-5181 (619) 532-4814

2.0 GROUNDWATER SAMPLING

The following sections summarize the June 2006 quarterly sampling event, the first of four consecutive events to be completed at UST Site 14121.

2.1 WATER LEVEL MEASUREMENTS

As part of the groundwater sampling event, the depth to water and the total depth of each well were measured from the top of the well casing and recorded on a well sampling log (Appendix A). Table 2-1 provides a summary of the groundwater elevation data. In one well, MW4, groundwater was slightly above the top of the well screen (0.65 feet).

A groundwater elevation contour map was prepared based on the most recently recorded water levels (Figure 2-1).

2.2 SAMPLING METHODOLOGY

On June 28, 2006, all monitoring wells (MW1, MW2, MW3, and MW4) were sampled using low-flow sampling methodology. Before sampling, a bladder pump was slowly lowered into each well and positioned approximately 2 feet below the surface of the groundwater table. In addition, a water-level indicator was placed at the water surface to monitor water-level drawdown during purging.

While purging at the lowest operational setting of the pump, which was approximately 100 milliliters per minute, the water level surface began to drop and exceeded the minimum drawdown requirement of 0.33 feet at wells MW2 and MW3. The drop in water level is likely attributed to low transmissivity aquifer materials. Since a stabilized water level could not be achieved at said wells, even at very low purging rates, a passive, or minimum purge, sampling method was performed following the methodology presented in a U.S. Environmental Protection Agency (EPA) Groundwater Issue paper titled *Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures* (Puls and Barcelona, 1996). The passive/minimal purge approach requires the removal of a minimum of three volumes of the sampling system from each well. The liquid volume of the sampling system consists of the volume of the pump's bladder, discharge tubing and flow-through cell attached to the water quality meter. After purging the required volume at the lowest flow rate achievable for each well, a groundwater sample was collected.

To monitor groundwater conditions during purging, water-quality parameters were measured as follows: temperature, pH, electrical conductivity, turbidity, dissolved oxygen, and oxygen/reduction potential. These measurements were recorded on the well sampling logs provided in Appendix A. After purging the required volume at the lowest flow rate achievable for each well, a groundwater sample was collected. Groundwater samples were collected through new disposable polyethylene discharge tubing, which was connected to the bladder pump. Each

sample was collected in the appropriate containers, labeled, and placed in a cooler with ice immediately after sample collection for delivery to the analytical laboratory.

All non-disposable down-hole equipment, such as the bladder pump and water-level indicator, were decontaminated before sampling each well.

2.3 SAMPLE ANALYSES

Groundwater samples were delivered by courier to EMAX Laboratories in Torrance, California, for analysis of TPH-d using EPA Method 8015B. One sample, collected from MW1 located in the former tank cavity (identified as 10-14121-40), was also sent to Microbial Insights, Inc., in Rockford, Tennessee, and analyzed for aerobic heterotrophic bacteria and diesel-oxidizing bacteria.

2.4 WASTE MANAGEMENT

All equipment decontamination water and groundwater generated from well purging were temporarily contained in Department of Transportation-approved drums and stored on site. The drums were closed, marked, labeled, and located to minimize traffic hazards and discourage tampering. The wastewater drums were transported off site for disposal at a waste-permitted facility. The handling, management, transportation, and disposal of wastewater were conducted in accordance with state and federal laws and regulations. No wastes were stored at the site for more than 60 days. A copy of the waste manifest is provided in Appendix B.

3.0 GROUNDWATER MONITORING RESULTS

Groundwater flow and analytical results from the June 2006 sampling event are discussed in the following subsections.

3.1 GROUNDWATER FLOW DIRECTION

Groundwater elevations measured during the June 2006 event are presented in Figure 2-1.

As shown on Figure 2-1, groundwater elevations at the site ranged from 287.62feet above mean sea level (amsl) at MW3 to 284.60 feet amsl at MW4. Based on water levels measured in June 2006, groundwater is flowing toward the southeast with an approximate gradient of 0.030 feet per foot (ft/ft).

3.2 ANALYTICAL RESULTS

A total of four samples (plus a field duplicate, a trip blank, and an equipment rinsate sample) were collected during the June 2006 event and sent to EMAX Laboratories for analysis. The analytical results were successfully uploaded to the Water Board Geotracker database (Confirmation No. 2176882505). A summary of groundwater sampling results is presented in Table 3-1 and Figure 2-1, and copies of the analytical laboratory reports and chain-of-custody forms are provided in Appendix C.

As shown on Table 3-1, TPH-d was detected in MW1, MW2 and MW3 at concentrations of 1.6 milligrams per liter (mg/L), 0.27 mg/L, and 0.15 mg/L, respectively.

The sample collected from MW1 was also analyzed for the presence of total aerobic heterotrophic bacteria and total diesel oxidizing bacteria (Table 3-1). Results indicated that $1.12E^{+04}$ total aerobic heterotrophic bacteria, and $6.55E^{+02}$ total diesel-oxidizing bacteria are naturally present in groundwater beneath the site. These bacteria are capable of degrading hydrocarbon contamination at the site and the total aerobic heterotrophic bacteria are present at levels above those considered optimal by the EPA ($1.0E^{+3}$) (EPA, 1995).

4.0 QUALITY ASSURANCE AND QUALITY CONTROL

This section summarizes the quality assurance and quality control (QC) results for the June 2006 groundwater monitoring event.

All groundwater samples were collected and preserved in accordance with the *San Diego County DEH Site Assessment and Mitigation Manual 2004* (DEH, 2004) and were delivered to the analytical laboratory within 24 hours of sample collection by a laboratory courier and analyzed within the method-specified analytical holding times. EMAX Laboratories, Inc., a state of California-certified and Naval Facilities Engineering Service Center-evaluated laboratory, performed sample analyses.

One field duplicate sample was collected from monitoring well MW1 (identified as 10-14121-041) and analyzed for TPH-d. The relative percent difference (RPD) between the field duplicate and primary sample (identified as 10-14121-040) results for TPH-d is 6 percent.

To assess potential cross-contamination of TPH-d, one equipment rinsate sample was collected (identified as 10-14121-042). Detectable levels of target analytes were not reported above half the project reporting limits in the equipment rinsate sample, indicating that the decontamination procedure yielded no cross-contamination during this sampling event.

In accordance with analytical method specifications, method blanks, surrogate spikes, laboratory control samples (LCSs), and LCS duplicates (LCSDs) were analyzed to assess method accuracy and precision.

No detectable levels of target analytes were found in the method blanks during this event. Percent recoveries in LCS, LCD, and surrogates and RPDs between the spiked duplicates were well within the project-specified QC acceptance limits.

In accordance with the Sampling and Analysis Plan (SES-TECH, 2005), Validata Chemical Services, Inc., a third-party validation company, located in Duluth, Georgia, performed EPA Level III/IV validation of analytical data. For this sampling event, one sample was validated according to the EPA Level IV protocol, and six samples (including field QC samples) were validated according to the EPA Level III protocol. The validation reported that all of the applicable criteria were met for all of the samples.

5.0 SUMMARY

Based on water-level measurements recorded for the June 2006 event, groundwater beneath the site flows to the southeast with a gradient of approximately 0.030 ft/ft. Groundwater elevations at the site ranged from 287.62 feet amsl at MW3 to 284.60 feet amsl at MW4.

The analytical results for the June 2006 groundwater sampling event were successfully uploaded to the Water Board Geotracker database (Confirmation No. 2176882505). During the June 2006 event, TPH-d was detected in three of the four monitoring wells at levels ranging between 0.15 and 1.6 micrograms per liter. Overall, the TPH-d concentrations were lower compared to previous sampling (June 2005), except for MW1 located in the former tank cavity, which had TPH-d slightly higher than that previously reported (1.6 mg/L versus 1.1 mg/L).

Results from bacterial culture analyses of groundwater at the site indicate the presence of total aerobic heterotrophic bacteria above levels considered optimal by the EPA for in situ hydrocarbon degradation.

This sampling event was the first of four consecutive quarterly events to be completed in order to support site closure. The second quarterly event is currently scheduled for September 2006. SES-TECH will continue to execute this sampling scheme and make a recommendation concerning further corrective action, if appropriate, upon its completion.

6.0 REFERENCES

SES-TECH. 2005. *Final Sampling and Analysis Plan UST Site 14121,MCB Camp Pendleton (Field Sampling Plan and Quality Assurance Project Plan, Revision 1.* April 29.

San Diego County Department of Environmental Health, Land and Water Quality Division (DEH). 2004. *San Diego County Site Assessment and Mitigation Manual 2004.*

Puls, R., and M.J. Barcelona. 1996. *Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures.* April.

U.S. Environmental Protection Agency (EPA). 1995. *How to Evaluate Alternative Cleanup Technologies for Underground Storage Tank Sites: A Guide for Corrective Action Plan Reviewers*. EPA 510-B-95-007. May.

TABLES

TABLE 2-1

SUMMARY OF GROUNDWATER LEVEL ELEVATIONS
UST SITE 14121, MCB CAMP PENDELTON, CA

Monitoring Well ID	Well Screen Interval (feet btoc)	Reference Point (toc) Elevation (feet amsl)	Date Measured	Depth to Water (feet btoc)	Groundwater Elevation (feet amsl)
MW1	9.5-24.5	297.50	15-Oct-97	12.88	284.62
			19-Jan-98(1)	11.97	285.53
			29-Apr-99	11.29	286.21
			11-Feb-03	12.16	285.34
			1-Jun-05	10.10	287.40
			19-Jun-06	11.34	286.16
MW2	7.5-22.5	295.29	15-Oct-97	11.14	284.15
			19-Jan-98(1)	9.89	285.40
			29-Apr-99	9.56	285.73
			11-Feb-03	10.25	285.04
			1-Jun-05	9.12	286.17
			19-Jun-06	9.92	285.37
MW3	9.5-24.5	298.28	15-Oct-97	13.41	284.87
			19-Jan-98(1)	11.46	286.82
			29-Apr-99	10.91	287.37
			11-Feb-03	dry	(dry)
			1-Jun-05	9.44	288.84
			19-Jun-06	10.66	287.62
MW4	9.5-24.5	293.45	5-Nov-97	10.38	283.07
			19-Jan-98(1)	8.78	284.67
			29-Apr-99	8.89	284.56
			11-Feb-03	8.95	284.50
			1-Jun-05	7.99	285.46
			19-Jun-06	8.85	284.60

Notes:

(1) - Groundwater elevation measurements only recorded during this period, no groundwater samples were collected.

amsl- above mean sea level

btoc- below top of casing

MCB- Marine Corps Base

toc- top of casing

UST- Underground Storage Tank

TABLE 3-1

SUMMARY OF GROUNDWATER SAMPLING RESULTS, UST SITE 14121, MCB CAMP PENDELTON, CA

Well ID	Date Sampled	Sample ID	TPH-d	VOCs											PAHs				Total Aerobic Heterotrophs	Total Diesel Oxidizing Bacteria
				Benzene	Toluene	Ethylbenzene	Xylenes (total)	N-Propylbenzene	Naphthalene	Trichloroethene	Tetrachloroethene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	MTBE	Acenaphthene	Acenaphthylene	Naphthalene	Fluorene		
			mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	cfu/mL	cfu/mL
MW1	15-Oct-97	not listed	**1.95**	--	--	3.2	3.2	2.6	21	--	2.1	8.3	4.1	na	--	--	10.4	2.6	na	na
	29-Apr-99	not listed	--	--	--	--	--	na	na	na	na	na	na	--	--	--	--	--	na	na
	28-Feb-03	020314121-001	--	--	--	--	--	--	na	1J	--	--	--	--	na	na	na	na	na	na
	1-Jun-05	0003-006	**1.1**	0.41J	--	--	--	na	na	na	na	na	na	--	1.0	0.27J	--	0.36J	na	na
	1-Jun-05	0003-007 (Dup)	**1.1**	0.39J	0.24J	--	0.36J	na	na	na	na	na	na	--	0.88J	0.24J	--	0.27J	na	na
	28-Jun-06	10-14121-040	**1.5**	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	1.12E+04	6.55E+02
	28-Jun-06	10-14121-041 (Dup)	**1.6**	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
MW2	15-Oct-97	not listed	--	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
	29-Apr-99	not listed	--	--	--	--	--	na	na	na	na	na	na	--	--	--	--	--	na	na
	28-Feb-03	020314121-002	--	--	--	--	--	--	na	3	--	--	--	--	na	na	na	na	na	na
	1-Jun-05	0003-004	**0.86**	0.46J	--	--	0.59J	na	na	na	na	na	na	--	--	--	--	--	na	na
	28-Jun-06	10-14121-039	**0.27**	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
MW3	15-Oct-97	not listed	--	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
	29-Apr-99	not listed	--	--	--	--	--	na	na	na	na	na	na	--	--	--	--	--	na	na
	28-Feb-03	well dry	--	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
	1-Jun-05	0003-005	**0.26**	--	--	--	--	na	na	na	na	na	na	--	--	--	--	--	na	na
	28-Jun-06	10-14121-037	**0.15**	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
MW4	5-Nov-97	not listed	--	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
	29-Apr-99	not listed	--	--	--	--	--	na	na	na	na	na	na	--	--	--	--	--	na	na
	28-Feb-03	020314121-003	--	--	--	--	--	--	na	--	--	--	--	--	na	na	na	na	na	na
	1-Jun-05	0003-003	**0.21**	0.32J	--	--	--	na	na	na	na	na	na	--	--	--	--	--	na	na
	28-Jun-06	10-14121-038	--	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Water Quality Objectives (WQOs)			0.1[(1)]	1	150	680	1750	30	0.5	5	5	[(2)]	[(2)]	13[(3)]	[(2)]	[(2)]	[(2)]	[(2)]	[(2)]	[(2)]

TABLE 3-1

SUMMARY OF GROUNDWATER SAMPLING RESULTS, UST SITE 14121, MCB CAMP PENDELTON, CA

Notes:

Bold values exceed listed WQO
(1)- Secondary taste and odor threshold value
(2)- No established WQO
(3)- California DHS proposed primary MCL
µg/L- micrograms per liter
-- - Not detected above project reporting limits
cfu/mL - colony forming units per milliliter
DHS - Department of Health Services
Dup- field duplicate sample
EPA - U.S. Environmental Protection Agency
J - estimated value
MCB- Marine Corps Base
MCL - Maximum Contaminant Level
mg/L- milligrams per liter
MTBE- methyl tert-butyl ether
na - not analyzed
PAH - polynuclear aromatic hydrocarbon (by EPA Method 8270C)
TPH-d - total petroleum hydrocarbons quantified as diesel (by EPA Method 8015B)
VOC - volatile organic compound (by EPA Method 8260B)
UST- Underground Storage Tank
WQO - water quality objective

FIGURES

DRAWN BY: MD	CHECKED BY: JS	APPROVED BY: MC	DCN: SES-TECH-06-0155	DRAWING NO: 06015511.DWG
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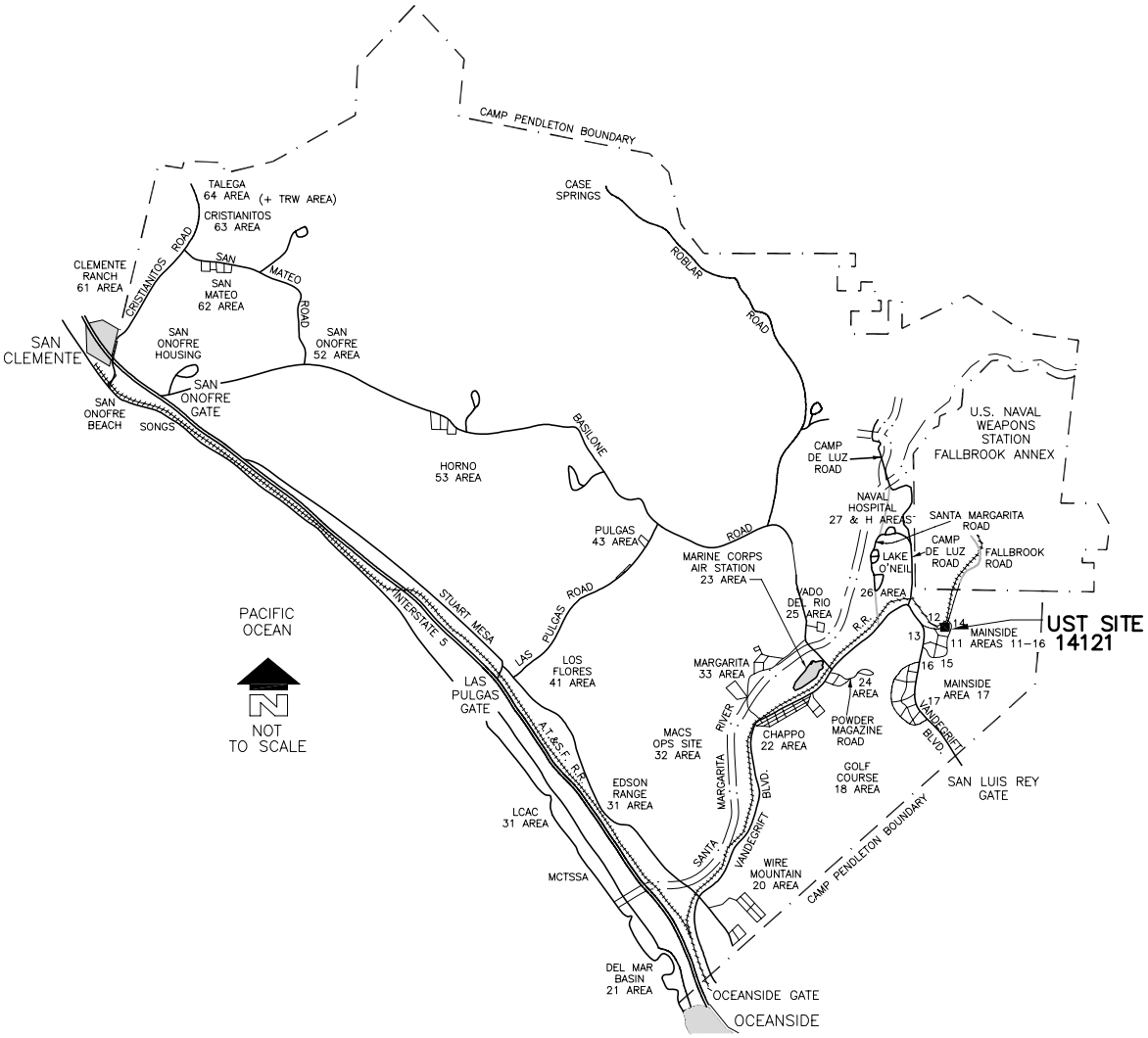

Figure 1-1
SITE LOCATION MAP

MCB CAMP PENDLETON

SES-TECH

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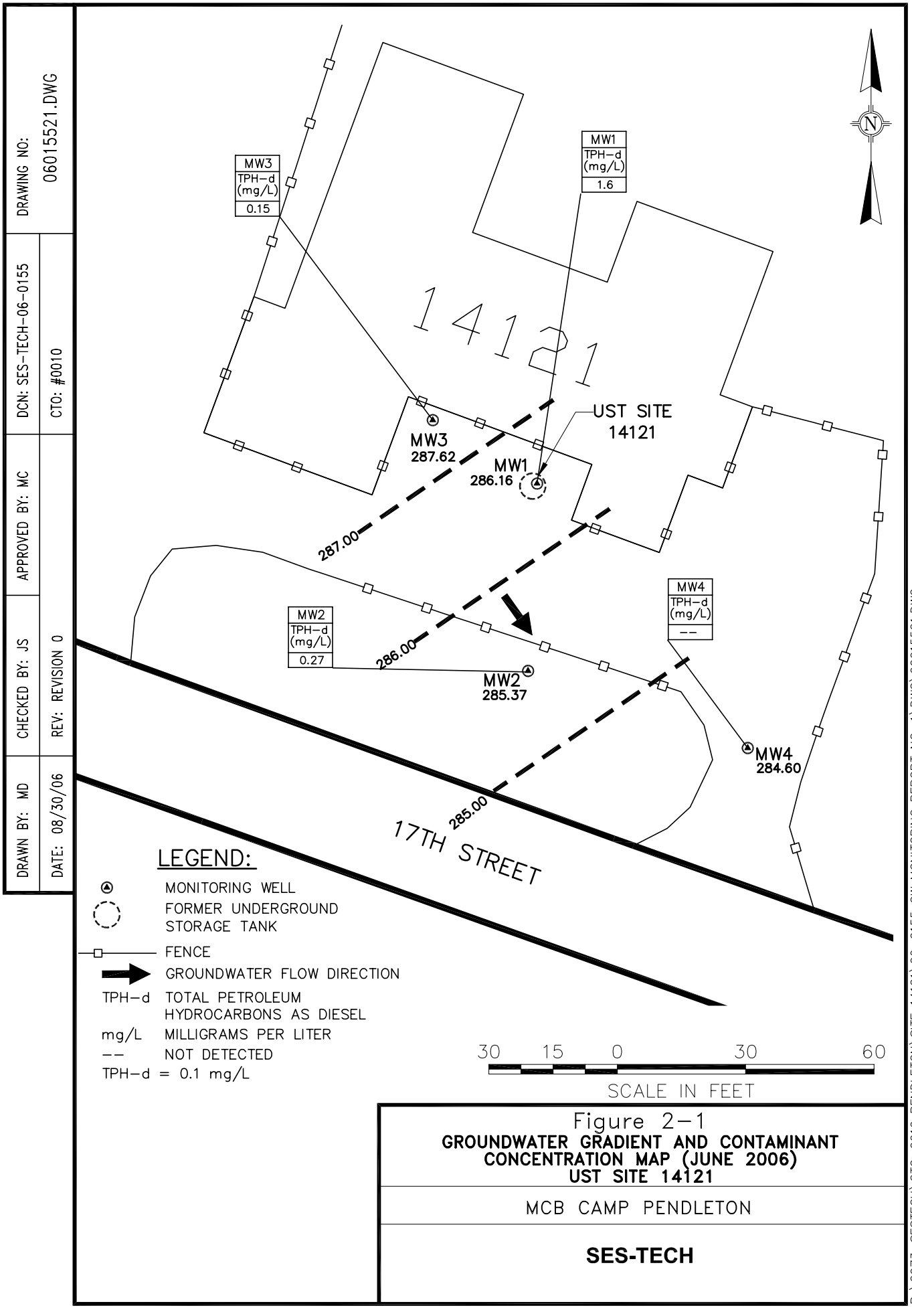
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DCN: SES-TECH-06-0155
CTO: #0010
APPROVED BY: MC
CHECKED BY: JS
REV: REVISION 0
DRAWN BY: MD
DATE: 08/30/06
MW3
TPH-d (mg/L)
0.15
MW1
TPH-d (mg/L)
1.6
14121
UST SITE 14121
MW3 287.62
MW1 286.16
287.00
MW2
TPH-d (mg/L)
0.27
286.00
MW2 285.37
MW4
TPH-d (mg/L)
--
MW4 284.60
285.00
17TH STREET
N
LEGEND:
MONITORING WELL
FORMER UNDERGROUND STORAGE TANK
FENCE
GROUNDWATER FLOW DIRECTION
TPH-d TOTAL PETROLEUM HYDROCARBONS AS DIESEL
mg/L MILLIGRAMS PER LITER
-- NOT DETECTED
TPH-d = 0.1 mg/L
30 15 0 30 60
SCALE IN FEET
Figure 2-1
GROUNDWATER GRADIENT AND CONTAMINANT CONCENTRATION MAP (JUNE 2006)
UST SITE 14121
MCB CAMP PENDLETON
SES-TECH
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PLOT/UPDATE: AUG 17 2006 15:20:43

APPENDIX A

WELL SAMPLING LOGS

SES-TECH

FIELD WATER LEVEL MEASUREMENTS

Date: 6/19/06
Personnel: W. Bryant, J. Sager, J. Bartlett
Weather: Warm, Sunny
Project Name: UST Site 14121
Project OFS: 2973
Meaurement Device: Solinst
Comments n/a

Well ID	Depth to Water from Measuring Point (feet)	Depth to Sediment from Measuring Point (feet)	Comments
MW4	8.85	24.03	
MW3	10.66	12.09	soft bottom obstru
MW2	9.92	22.11	
MW1	11.34	24.58	

SES-TECH

LOW-FLOW PURGING AND SAMPLING DATA SHEET

Project Name: Camp Pendleton / 14131 Well Number: MW1
Project Number: 2973.0100 Equipment: Horiba U-22
Date: 6/28/06 Sample ID: ID-14131-040 Time: 1251
Site Engineer(s): VB VB Contractor: 041 1256

Reference: Top of Casing	Before	After
Depth to Water (ft)	11.31	11.44
Depth of Well (ft)	24.58	
Depth to Top of Screen (ft)	9.50	
Screen Length (ft)	15.0	
Pump Depth (ft)	≈13	
Pump Rate	100 mL/min	
Sample Pump Rate	100mL/min	
System Volume (mL)	—	

Total Volume Purged (mL): 1500

System Volume (mL) = (2.4*H)+470
where
2.4mL/ft = tubing volume per foot (1/8" I.D.)
H = length of tubing in feet
470 mL = Bladder volume + Flowthru cell volume

Time	pH	Conductivity (umhos)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mv)	Turbidity (NTU)	Depth to Water (ft)	Cum. Volume (mL)	Comments
1230									Purge
1233	6.08	15200	4.80	26.49	-14	109.0	11.40	300	Clear, Mg, C
1236	6.03	14600	2.45	26.32	-14	106.0	11.42	600	Odor
1239	6.02	14400	1.20	26.38	-10	101.0	11.42	900	"
1242	6.02	14300	0.91	26.43	-7	101.0	11.44	1200	"
1245	6.02	14500	0.83	26.85	-5	96.0	11.45	1500	"
1248									"
1251									collect samp
1256									collect DUP
Stability:	± 0.2 units	± 5 %	± 0.2 mg/L	± 3 %	± 20 mV	± 10 %			

Hach Fe^{2+} N/A

* Include Microbial

Samples were collected directly from pump unless otherwise noted.

SES-TECH

LOW-FLOW PURGING AND SAMPLING DATA SHEET

Project Name: Camp Pendleton / 14121 Well Number: MW2
Project Number: 2973.0100 Equipment: Horiba U-22
Date: 6/28/06 Sample ID: 10-14121-039 Time: 1145
Site Engineer(s): WB, JB Contractor: na

Reference: Top of Casing	Before	After
Depth to Water (ft)	9.80	10.58
Depth of Well (ft)	22.11	
Depth to Top of Screen (ft)	7.5	
Screen Length (ft)	15	
Pump Depth (ft)	11.5	
Pump Rate	100 mL/min	
Sample Pump Rate	100 mL/min	
System Volume (mL)	498	

Total Volume Purged (mL): 1800

System Volume (mL) = (2.4*H)+470
where
2.4mL/ft = tubing volume per foot (1/8" I.D.)
H = length of tubing in feet
470 mL = Bladder volume + Flowthru cell volume

Time	pH	Conductivity (umhos)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mv)	Turbidity (NTU)	Depth to Water (ft)	Cum. Volume (mL)	Comments
1121									Pump on
1124	5.73	18700	2.32	25.00	185	0.0	300	10.03	clear no odor
1127	5.73	18200	1.53	24.54	189	0.0	600	10.16	"
1130	5.73	18100	1.06	24.32	190	0.7	900	10.25	"
1133	5.73	18100	0.99	24.01	193	16.4	1200	10.38	"
1136	5.74	19700	0.76	24.10	184	21.10	1500	10.50	"
1139	5.75	19800	0.69	24.00	183	22.3	1800	10.58	"
1142									stable
1145									collect samples
Stability:	± 0.2 units	± 5 %	± 0.2 mg/L	± 3 %	± 20 mV	± 10 %			

Hach Fe^{2+} N/A

Samples were collected directly from pump unless otherwise noted.

SES-TECH

LOW-FLOW PURGING AND SAMPLING DATA SHEET

Project Name: Camp Pendleton 14121 Well Number: MW3
Project Number: 2973.0100 Equipment: Honda U-22
Date: 6/28/06 Sample ID: 10-14121-037 Time: 1012
Site Engineer(s): WB, DB Contractor: n/a

Reference: Top of Casing	Before	After
Depth to Water (ft)	10.50	11.40
Depth of Well (ft)	12.9	
Depth to Top of Screen (ft)	≈ 9.5	
Screen Length (ft)	15	
Pump Depth (ft)	10 12.5	
Pump Rate	100 mL/min	
Sample Pump Rate	100 mL/min	
System Volume (mL)	500	

Total Volume Purged (mL): 1800

500 = (2.4 x 12.5) + 470

System Volume (mL) = (2.4*H)+470
where
2.4mL/ft = tubing volume per foot (1/8" I.D.)
H = length of tubing in feet
470 mL = Bladder volume + Flowthru cell volume

Time	pH	Conductivity (umhos)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mv)	Turbidity (NTU)	Depth to Water (ft)	Cum. Volume (mL)	Comments
0948									pump on
0951	6.40	8140	0.48	23.08	-90	742	10.33	300	Black H2O
0954	6.42	10800	0.47	22.99	-80	431	11.01	600	" SMa
0957	6.41	11800	0.45	22.91	-82	106.0	11.20	900	Cloudy, SMa
1000	6.42	11800	0.38	23.00	-84	70.6	11.20	1200	" "
1003	6.43	11800	0.35	22.95	-88	54.6	11.30	1500	" "
1006	6.43	11800	0.34	23.04	-90	48.6	11.40	1800	slightly cloudy
1009									Stable
1012									Collect Samples
Stability:	± 0.2 units	± 5 %	± 0.2 mg/L	± 3 %	± 20 mV	± 10 %			

Hach Fe^{2+} N/A

* Black Water
* Turbidity very high due to black material in well

Samples were collected directly from pump unless otherwise noted.

SES-TECH

Page ___ of ___

LOW-FLOW PURGING AND SAMPLING DATA SHEET

Project Name: Camp Pendleton / 14121 Well Number: MW4
Project Number: 2973.0100 Equipment: Horiba
Date: 6/28/06 Sample ID: 10-14121-038 Time:
Site Engineer(s): WB, JB Contractor:

Reference: Top of Casing	Before	After
Depth to Water (ft)	8.80	
Depth of Well (ft)	24.03	
Depth to Top of Screen (ft)	≈9.5	
Screen Length (ft)	15	
Pump Depth (ft)	10.5	
Pump Rate	100 ml/min	
Sample Pump Rate	100 ml/min	
System Volume (mL)	495	

Total Volume Purged (mL): 1800

495 = (2.4 x 10.5) + 470

System Volume (mL) = (2.4*H)+470
where
2.4mL/ft = tubing volume per foot (1/8" I.D.)
H = length of tubing in feet
470 mL = Bladder volume + Flowthru cell volume

Time	pH	Conductivity (umhos)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mv)	Turbidity (NTU)	Depth to Water (ft)	Cum. Volume (mL)	Comments
1039									pump on
1042	6.26	9160	2.10	25.00	103	0.0	9.02	300	filter, proc
1045	6.23	9060	1.28	25.06	106	0.0	9.13	600	
1048	6.22	9250	1.27	25.17	114	20.0*	9.15	900	
1051	6.22	9310	1.19	25.20	116	0.0	9.25	1200	
1054	6.26	14800	1.11	25.21	122	0.0	9.35	1500	
1057	6.26	14300	1.09	25.20	124	1.5	9.40	1800	
1100									stable
1103									
Stability:	± 0.2 units	± 5 %	± 0.2 mg/L	± 3 %	± 20 mV	± 10 %			

Hach Fe^{2+} N/A

*questionable turbidity reading.

Samples were collected directly from pump unless otherwise noted.

APPENDIX B

NON-HAZARDOUS WASTE MANIFEST

NON-HAZARDOUS WASTE MANIFEST

Please print or type (Form designed for use on elite (12 pitch) typewriter)

NON-HAZARDOUS WASTE MANIFEST	1. Generator's US EPA ID No. CA2170023533	Manifest Document No. 63002	2. Page 1 of 1

3. Generator's Name and Mailing Address
AC/S Environmental Security
P.O. Box 555008
Camp Pendleton, CA 92055-5008

4. Generator's Phone (760-725-4321 Attn: Nate Deleston

5. Transporter 1 Company Name	6. US EPA ID Number	A. State Transporter's ID	
General Environmental Mgmt Inc.	CAD983649880	B. Transporter 1 Phone	800-326-1011
7. Transporter 2 Company Name	8. US EPA ID Number	C. State Transporter's ID	
		D. Transporter 2 Phone	
9. Designated Facility Name and Site Address	10. US EPA ID Number	E. State Facility's ID	
U.S. Ecology Corp. Highway 95 - 12 miles south of Beatty Beatty, NV 89003	NVT330010000	F. Facility's Phone	800 239 3943

11. WASTE DESCRIPTION	12. Containers No.	Type	13. Total Quantity	14. Unit Wt./Vol.
a. Non hazardous liquid (Well Water)	008	D M	00440 ~~00995~~ [illegible] 7/13/06	G
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above
11a) 8 x55g-Well Water-Approval#

--

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
Emergency Phone: (800) 326-1011 (GEM)
Site:US Marine Corps-Camp Penleton-Bldg#22165 Assistant Chief,Camp Pendleton, CA 92055
Berm Equip. Decon water,
16144, 2389, 14121, 14131, 14137, 43402 SWO #164947

16. **GENERATOR'S CERTIFICATION:** I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.

Wendy Bryant [signature] TEEC Inc 07/13/06

Printed/Typed Name	Signature	Date Month Day Year
NATHANIEL D. DELESTON ~~Wendy Bryant~~ 6/13	[signature]	07 13 06

17. Transporter 1 Acknowledgement of Receipt of Materials 7/13/06

Printed/Typed Name	Signature	Date Month Day Year
Rudy Negrete	[signature]	07 13 06

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator; Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name	Signature	Date Month Day Year

GENERATOR — TRANSPORTER — FACILITY — NON-HAZARDOUS WASTE

APPENDIX C

LABORATORY ANALYTICAL REPORTS AND CHAIN-OF-CUSTODY FORMS

NUMBER 20010

TETRA TECH
1230 Columbia Street, Suite 500
San Diego, CA 92101 (619) 234-8696

CHAIN-OF-CUSTODY RECORD

PROJECT NAME: WE Camp Pendleton	PURCHASE ORDER NO.: TBD
PROJECT LOCATION: UST Site 14121	PROJECT NO: 2973.0100
SAMPLER NAME: Wendy Bryant	AIRBILL NUMBER: Courier
PROJECT CONTACT: Dick Weinberger	PROJECT CONTACT PHONE NUMBER: 949-756-7558

ANALYSES REQUIRED

LABORATORY NAME: EMAX

LABORATORY ID (FOR LABORATORY):

COMMENTS:

Project Information Section Do not submit to Laboratory

SAMPLE ID	DATE COLLECTED	TIME COLLECTED	NO. OF CONTAINER	LEVEL 3	LEVEL 4	TYPE	TAT	8260B	TPH-D	LOCATION	DEPTH START	DEPTH END	QC
10-14121-037	6/28/06	1012	1	X		W	10 Day	X		14121-MW3			Reg
10-14121-038	6/28/06	1103	1	X		W	10 Day	X		14121-MW4			Reg
10-14121-039	6/28/06	1145	3 (MS/MSD)	X		W	10 Day	X		14121 MW2			Reg
10-14121-040	6/28/06	1251	1 (MS/MSD)	X		W	10 Day	X		14121-MW1			Reg
10-14121-041	6/28/06	1250	1		X	W	10 Day	X		14121-MW1			Dup
10-14121-042	6/28/06	1330	1	X		W	10 Day	X		EquipRinse			ER

RELINQUISHED BY (Signature)	DATE: 6/28/06	RECEIVED BY (Signature)	LABORATORY INSTRUCTIONS/COMMENTS
COMPANY: TtEC	TIME: 1450	COMPANY: EMAX	
RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)	COMPOSITE DESCRIPTION
COMPANY	TIME	COMPANY	
RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)	**SAMPLE CONDITION UPON RECEIPT (FOR LABORATORY)**
COMPANY	TIME	COMPANY	TEMPERATURE: _____ SAMPLE CONDITION: ☐ INTACT ☐ BROKEN
			COOLER SEAL: ☐ INTACT ☐ BROKEN

SAMPLING COMMENT:

White - Laboratory; Pink - Laboratory; Canary - Project File; Manila - Data Management

TETRA TECH
1230 Columbia Street, Suite 500
San Diego, CA 92101 (619) 234-8696

NUMBER 20011

CHAIN-OF-CUSTODY RECORD

PROJECT NAME: Camp Pendleton	PURCHASE ORDER NO.: TBD
PROJECT LOCATION: UST Site 1421	PROJECT NO.: 2973.0100
SAMPLER NAME: Wendy Bryant	AIRBILL NUMBER: Fedex
PROJECT CONTACT: Nick Weinberger	PROJECT CONTACT PHONE NUMBER:

SAMPLE ID	DATE COLLECTED	TIME COLLECTED	NO. OF CONTAINER	LEVEL 3	LEVEL 4	TYPE	TAT	ANALYSES REQUIRED: Total Heterotrophic Plate Count	ANALYSES REQUIRED: Total diesel degraders	COMMENTS	LOCATION	DEPTH START	DEPTH END	QC
ID-1421-40	6/28/12	1251	2	X		W		X	X		1421-MW1			BG

LABORATORY NAME: Microbial Insights

LABORATORY ID (FOR LABORATORY):

Project Information Section Do not submit to Laboratory

RELINQUISHED BY (Signature)	DATE 6/28/12	RECEIVED BY (Signature)	LABORATORY INSTRUCTIONS/COMMENTS: Use Standard TAT based on pricing in P.O.
COMPANY TtEC	TIME 5pm	COMPANY FedEx	
RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)	COMPOSITE DESCRIPTION
COMPANY	TIME	COMPANY	
RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)	SAMPLE CONDITION UPON RECEIPT (FOR LABORATORY)
COMPANY	TIME	COMPANY	TEMPERATURE: _____ SAMPLE CONDITION: ☐ INTACT ☐ BROKEN COOLER SEAL: ☐ INTACT ☐ BROKEN

SAMPLING COMMENT:

White - Laboratory; Pink - Laboratory; Canary - Project File; Manila - Data Management

TABLE OF CONTENTS

CLIENT: **SES-TECH**

PROJECT: **CAMP PENDLETON, UST SITE 14121**

SDG: **06F288**

** - Not Requested

EMAX
LABORATORIES, INC.
1835 W. 205th Street
Torrance, CA 90501
Tel: (310) 618-8889
Fax: (310) 618-0818

Date: 07-06-2006
EMAX Batch No.: 06F288

Attn: Nick Weinberger

SES-TECH
1940 E. Deere Avenue, Suite 200
Santa Ana CA 92705

Subject: Laboratory Report
Project: Camp Pendleton, UST Site 14121

Enclosed is the Laboratory report for samples received on 06/28/06.
The data reported include :

Sample ID	Control #	Col Date	Matrix	Analysis
10-14121-037	F288-01	06/28/06	WATER	TPH DIESEL
10-14121-038	F288-02	06/28/06	WATER	TPH DIESEL
10-14121-039	F288-03	06/28/06	WATER	TPH DIESEL
10-14121-040	F288-04	06/28/06	WATER	TPH DIESEL
10-14121-041	F288-05	06/28/06	WATER	TPH DIESEL
10-14121-042	F288-06	06/28/06	WATER	TPH DIESEL
10-14121-039MS	F288-03M	06/28/06	WATER	TPH DIESEL
10-14121-039MSD	F288-03S	06/28/06	WATER	TPH DIESEL

The results are summarized on the following pages.

Please feel free to call if you have any questions concerning these results.

Sincerely yours,

Kam Y. Pang, Ph.D.
Laboratory Director

NUMBER 20010

TETRA TECH
1230 Columbia Street, Suite 500
San Diego, CA 92101 (619) 234-8696

CHAIN-OF-CUSTODY RECORD

06F288

PROJECT NAME: Camp Pendleton UST Site 14121	PURCHASE ORDER NO: TBD
PROJECT LOCATION:	PROJECT NO: 2973.0100
SAMPLER NAME: Wendy Bryant	AIRBILL NUMBER: Courier
PROJECT CONTACT: Nick Weinberger	PROJECT CONTACT PHONE NUMBER: 949-756-7588

ANALYSES REQUIRED: 8015B TPH-D

LABORATORY NAME: EMAX

LABORATORY ID (FOR LABORATORY): 06F288

	SAMPLE ID	DATE COLLECTED	TIME COLLECTED	NO. OF CONTAINER	LEVEL 3	LEVEL 4	TYPE	TAT	COMMENTS
1	10-14121-037	6/28/06	1012	1	X		W	10 Day	X
2	10-14121-038	6/28/06	1103	1	X		W	10 Day	X
3	10-14121-039	6/28/06	1145	MS X3	X		W	10 Day	X
4	10-14121-040	6/28/06	1251	MS B1	X		W	10 Day	X
5	10-14121-041	6/28/06	1250	1		X	W	10 Day	X
6	10-14121-042	6/28/06	1330	1	X		W	10 Day	X

RELINQUISHED BY (Signature)	DATE 6/28/06	RECEIVED BY (Signature)	LABORATORY INSTRUCTIONS/COMMENTS
COMPANY TTEC	TIME 1450	COMPANY EMAX	
RELINQUISHED BY (Signature)	DATE 6/28/06	RECEIVED BY (Signature)	COMPOSITE DESCRIPTION
COMPANY EMAX	TIME 1825	COMPANY emax	
RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)	SAMPLE CONDITION UPON RECEIPT (FOR LABORATORY)
COMPANY	TIME	COMPANY	TEMPERATURE 3.0 SAMPLE CONDITION: ☒ INTACT ☐ BROKEN
			COOLER SEAL: ☒ INTACT ☐ BROKEN

1001

SAMPLE RECEIPT FORM 1

Type of Delivery	Delivered By/Airbill		
☑ EMAX Courier		ECN	06F288
☐ Client Delivery		Recepient	V. CUNA
☐ Third Party		Date	062806
		Time	1825

COC Inspection

☑ Client Name	☑ Sampler Name	☑ Sampling Date/Time/Location
☑ Address	☑ Courier Signature/Date/Time	☑ Analysis Required
☑ Client PM/FC	☑ TAT	☑ Matrix
☐ Tel. #/Fax #	☑ Sample ID	☐ Preservative (if any)
Safety Issues ☐ None	☐ High Concentrations expected	☐ Superfund Site Samples
Comments: ☐ Rad Screening Required		

Packaging Inspection

Container	☑ Cooler	☐ Box	☐	☐
Condition	☑ Custody Seal	☐ Intact	☐ Damaged	☐
Packaging	☐ Bubble Pack	☐ Styrofoam	☑ Sufficient	☐
Temperatures	☐ Cooler 1 3.0°C	☑ Cooler 2 ____	☐ Cooler 3 ____	☐ Cooler 4 ____
	☐ Cooler 5 ____	☐ Cooler 6 ____	☐ Cooler 7 ____	☐ Cooler 8 ____
	☐ Cooler 9 ____	☐ Cooler 10 ____	☐ Cooler 11 ____	☐ Cooler 12 ____

Comments:

LSCID	Client ID	Discrepancy	Corrective Action
		*	

LSCID : Lab Sample Container ID

REVIEWS

Sample Labeling JL Date 6/28/06

SRF [signature] Date 6/28/06

PM [signature] Date 6/29/06

REPORTING CONVENTIONS

DATA QUALIFIERS:

Lab Qualifier	AFCEE Qualifier	Description
J	F	Indicates that the analyte is positively identified and the result is less than RL but greater than MDL.
N		Indicates presumptive evidence of a compound.
B	B	Indicates that the analyte is found in the associated method blank as well as in the sample at above QC level.
E	J	Indicates that the result is above the maximum calibration range.
*	*	Out of QC limit.

Note: The above qualifiers are used to flag the results unless the project requires a different set of qualification criteria.

ACRONYMS AND ABBREVIATIONS:

CRDL	Contract Required Detection Limit
RL	Reporting Limit
MRL	Method Reporting Limit
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
DO	Diluted out

DATES

The date and time information for leaching and preparation reflect the beginning date and time of the procedure unless the method, protocol, or project specifically requires otherwise.

LABORATORY REPORT FOR

SES-TECH

CAMP PENDLETON, UST SITE 14121

METHOD 3520C/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

SDG#: 06F288

CASE NARRATIVE

CLIENT: **SES-TECH**

PROJECT: **CAMP PENDLETON, UST SITE 14121**

SDG: **06F288**

METHOD 3520C/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Six (6) water samples were received on 06/28/06 for Total Petroleum Hydrocarbons by Extraction analysis by Method 3520C/8015B in accordance with SW846 3RD Edition.

1. **Holding Time**

   Analytical holding time was met. Extraction was performed on 06/29/06 and completed on 06/30/06.

2. **Calibration**

   Initial calibration was seven points for Diesel. %RSDs were within 20%. Continuing calibrations were carried out at 12-hour intervals and all recoveries were within 85-115%.

3. **Method Blank**

   Method blank was free of contamination at half of the reporting limit.

4. **Surrogate Recovery**

   All recoveries were within QC limits.

5. **Lab Control Sample/Lab Control Sample Duplicate**

   All recoveries were within QC limits.

6. **Matrix Spike/Matrix Spike Duplicate**

   Sample F288-03 was spiked. Recoveries were within QC limits.

7. **Sample Analysis**

   Samples were analyzed according to the prescribed QC procedures. All criteria were met. Sample results were quantitated from C10 to C24 using Diesel (C10-C24) calibration factor.

   Samples F288-01 displayed as mixed fuel pattern.

   Samples F288-03 to -05 displayed motor oil-like fuel pattern.

LAB CHRONICLE
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Client : SES-TECH
Project : CAMP PENDLETON, UST SITE 14121

SDG NO. : 06F288
Instrument ID : GCT105

WATER

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	Analysis DateTime	Extraction DateTime	Sample Data FN	Calibration Data FN	Prep. Batch	Notes
MBLK1W	DSF044WB	1	NA	06/30/0613:30	06/29/0612:30	LF30012A	LF30010A	DSF044W	Method Blank
LCS1W	DSF044WL	1	NA	06/30/0613:47	06/29/0612:30	LF30013A	LF30010A	DSF044W	Lab Control Sample (LCS)
LCS2W	DSF044WC	1	NA	06/30/0614:03	06/29/0612:30	LF30014A	LF30010A	DSF044W	LCS Duplicate
10-14121-037	F288-01	1	NA	06/30/0617:45	06/29/0612:30	LF30027A	LF30022A	DSF044W	Field Sample
10-14121-038	F288-02	.95	NA	06/30/0618:02	06/29/0612:30	LF30028A	LF30022A	DSF044W	Field Sample
10-14121-039	F288-03	.95	NA	06/30/0618:19	06/29/0612:30	LF30029A	LF30022A	DSF044W	Field Sample
10-14121-040	F288-04	.96	NA	06/30/0619:10	06/29/0612:30	LF30032A	LF30022A	DSF044W	Field Sample
10-14121-041	F288-05	1	NA	06/30/0619:27	06/29/0612:30	LF30033A	LF30022A	DSF044W	Field Sample
10-14121-042	F288-06	.95	NA	06/30/0621:24	06/29/0612:30	LF30040A	LF30034A	DSF044W	Field Sample
10-14121-039MS	F288-03M	1	NA	06/30/0618:36	06/29/0612:30	LF30030A	LF30022A	DSF044W	Matrix Spike Sample (MS)
10-14121-039MSD	F288-03S	.95	NA	06/30/0618:53	06/29/0612:30	LF30031A	LF30022A	DSF044W	MS Duplicate (MSD)

FN - Filename
% Moist - Percent Moisture

SAMPLE RESULTS

METHOD 3520C/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Client	: SES-TECH	Date Collected:	06/28/06
Project	: CAMP PENDLETON, UST SITE 14121	Date Received:	06/28/06
Batch No.	: 06F288	Date Extracted:	06/29/06 12:30
Sample ID:	10-14121-037	Date Analyzed:	06/30/06 17:45
Lab Samp ID:	F288-01	Dilution Factor:	1
Lab File ID:	LF30027A	Matrix :	WATER
Ext Btch ID:	DSF044W	% Moisture :	NA
Calib. Ref.:	LF30022A	Instrument ID :	GCT105

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
DIESEL	.15	.1	.025

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	68	65-135

RL : Reporting Limit

Parameter	H-C Range
Diesel	C10-C24

			Spike	QC Limit	QC Limit
SURR : Hexacosane		Water	0.25 mg/L	63-165%	65-135%
		Soil	25 mg/kg	54-176%	60-160%

METHOD 3520C/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Client : SES-TECH	Date Collected: 06/28/06
Project : CAMP PENDLETON, UST SITE 14121	Date Received: 06/28/06
Batch No. : 06F288	Date Extracted: 06/29/06 12:30
Sample ID: 10-14121-038	Date Analyzed: 06/30/06 18:02
Lab Samp ID: F288-02	Dilution Factor: .95
Lab File ID: LF30028A	Matrix : WATER
Ext Btch ID: DSF044W	% Moisture : NA
Calib. Ref.: LF30022A	Instrument ID : GCT105

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
DIESEL	ND	.095	.024

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	106	65-135

RL : Reporting Limit

Parameter	H-C Range
Diesel	C10-C24

			Spike	QC Limit	QC Limit
SURR : Hexacosane		Water	0.25 mg/L	63-165%	65-135%
		Soil	25 mg/kg	54-176%	60-160%

METHOD 3520C/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Client : SES-TECH	Date Collected: 06/28/06
Project : CAMP PENDLETON, UST SITE 14121	Date Received: 06/28/06
Batch No. : 06F288	Date Extracted: 06/29/06 12:30
Sample ID: 10-14121-039	Date Analyzed: 06/30/06 18:19
Lab Samp ID: F288-03	Dilution Factor: .95
Lab File ID: LF30029A	Matrix : WATER
Ext Btch ID: DSF044W	% Moisture : NA
Calib. Ref.: LF30022A	Instrument ID : GCT105

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
DIESEL	.27	.095	.024

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	110	65-135

RL : Reporting Limit

Parameter	H-C Range
Diesel	C10-C24

			Spike	QC Limit	QC Limit
SURR	: Hexacosane	Water	0.25 mg/L	63-165%	65-135%
		Soil	25 mg/kg	54-176%	60-160%

METHOD 3520C/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Client : SES-TECH	Date Collected: 06/28/06
Project : CAMP PENDLETON, UST SITE 14121	Date Received: 06/28/06
tch No. : 06F288	Date Extracted: 06/29/06 12:30
mple ID: 10-14121-040	Date Analyzed: 06/30/06 19:10
Lab Samp ID: F288-04	Dilution Factor: .96
Lab File ID: LF30032A	Matrix : WATER
Ext Btch ID: DSF044W	% Moisture : NA
Calib. Ref.: LF30022A	Instrument ID : GCT105

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
DIESEL	1.5	.096	.024

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	102	65-135

RL : Reporting Limit

Parameter	H-C Range
Diesel	C10-C24

			Spike	QC Limit	QC Limit
SURR : Hexacosane		Water	0.25 mg/L	63-165%	65-135%
		Soil	25 mg/kg	54-176%	60-160%

METHOD 3520C/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Client : SES-TECH	Date Collected: 06/28/06
Project : CAMP PENDLETON, UST SITE 14121	Date Received: 06/28/06
Batch No. : 06F288	Date Extracted: 06/29/06 12:30
Sample ID: 10-14121-041	Date Analyzed: 06/30/06 19:27
Lab Samp ID: F288-05	Dilution Factor: 1
Lab File ID: LF30033A	Matrix : WATER
Ext Btch ID: DSF044W	% Moisture : NA
Calib. Ref.: LF30022A	Instrument ID : GCT105

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
DIESEL	1.6	.1	.025

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	106	65-135

RL : Reporting Limit

Parameter	H-C Range
Diesel	C10-C24

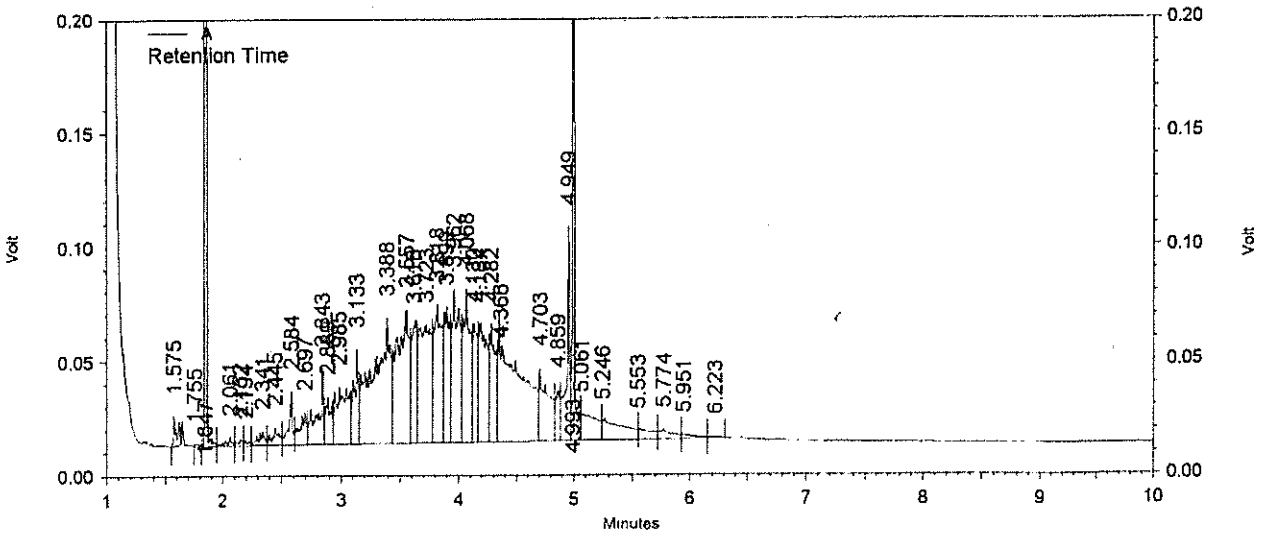
			Spike	QC Limit	QC Limit
SURR : Hexacosane		Water	0.25 mg/L	63-165%	65-135%
		Soil	25 mg/kg	54-176%	60-160%

METHOD 8015 by GC/FID
EMAX Laboratories, Inc.

Inst. Name: : GC105 (Offline)
File : D:\EZCHROM\CHROM\105F30\LF30.033
Method : D:\EZCHROM\METHODS\DS105F28.met
Sequence: : D:\EZCHROM\SEQUENCE\105F30.seq
Sample ID : 06F288-05
Acquired : 06/30/06 19:27:03
Printed : 07/03/06 15:57:57
User : System

A Results

Name	Retention Time	Area	Average RF	ESTD concentration
BROMOBENZENE	1.847	1424869	15831.70808	90.001
HEXACOSANE	4.993	770134	29142.35319	26.427
Totals		2195003		116.428
DIESEL(TOTAL)		5165428	29757.13629	176.440
DIESEL(C10-C24)		4622128	29230.81486	157.940
DIESEL(C10-C28)		5052233	29265.15514	172.636
Totals		14839789		507.017



Software Version: Version 3.1.7

METHOD 3520C/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Client	: SES-TECH	Date Collected:	06/28/06
Project	: CAMP PENDLETON, UST SITE 14121	Date Received:	06/28/06
tch No.	: 06F288	Date Extracted:	06/29/06 12:30
ample ID	: 10-14121-042	Date Analyzed:	06/30/06 21:24
Lab Samp ID	: F288-06	Dilution Factor:	.95
Lab File ID	: LF30040A	Matrix	: WATER
Ext Btch ID	: DSF044W	% Moisture	: NA
Calib. Ref.	: LF30034A	Instrument ID	: GCT105

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
DIESEL	ND	.095	.024

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	112	65-135

RL : Reporting Limit

Parameter	H-C Range
Diesel	C10-C24

			Spike	QC Limit	QC Limit
SURR	: Hexacosane	Water	0.25 mg/L	63-165%	65-135%
		Soil	25 mg/kg	54-176%	60-160%

QC SUMMARIES

METHOD 3520C/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Client : SES-TECH	Date Collected: NA
Project : CAMP PENDLETON, UST SITE 14121	Date Received: 06/29/06
Batch No. : 06F288	Date Extracted: 06/29/06 12:30
Sample ID: MBLK1W	Date Analyzed: 06/30/06 13:30
Lab Samp ID: DSF044WB	Dilution Factor: 1
Lab File ID: LF30012A	Matrix : WATER
Ext Btch ID: DSF044W	% Moisture : NA
Calib. Ref.: LF30010A	Instrument ID : GCT105

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
DIESEL	ND	.1	.025

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	107	65-135

RL : Reporting Limit

Parameter	H-C Range
Diesel	C10-C24

			Spike	QC Limit	QC Limit
SURR	: Hexacosane	Water	0.25 mg/L	63-165%	65-135%
		Soil	25 mg/kg	54-176%	60-160%

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14121
BATCH NO.: 06F288
METHOD: METHOD 3520C/8015B

MATRIX: WATER % MOISTURE: NA
DILUTION FACTOR: 1 1 1
SAMPLE ID: MBLK1W
LAB SAMP ID: DSF044WB DSF044WL DSF044WC
LAB FILE ID: LF30012A LF30013A LF30014A
DATE EXTRACTED: 06/29/0612:30 06/29/0612:30 06/29/0612:30 DATE COLLECTED: NA
DATE ANALYZED: 06/30/0613:30 06/30/0613:47 06/30/0614:03 DATE RECEIVED: 06/29/06
PREP. BATCH: DSF044W DSF044W DSF044W
CALIB. REF: LF30010A LF30010A LF30010A

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Diesel	ND	5	4.87	97	5	4.65	93	5	65-135	30

SURROGATE PARAMETER	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	QC LIMIT (%)
Hexacosane	.25	.291	116	.25	.28	112	65-135

EMAX QUALITY CONTROL DATA
MS/MSD ANALYSIS

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14121
TCH NO.: 06F288
HOD: METHOD 3520C/8015B

MATRIX: WATER % MOISTURE: NA
DILUTION FACTOR: .95 1 .95
SAMPLE ID: 10-14121-039
LAB SAMP ID: F288-03 F288-03M F288-03S
LAB FILE ID: LF30029A LF30030A LF30031A
DATE EXTRACTED: 06/29/0612:30 06/29/0612:30 06/29/0612:30 DATE COLLECTED: 06/28/06
DATE ANALYZED: 06/30/0618:19 06/30/0618:36 06/30/0618:53 DATE RECEIVED: 06/28/06
PREP. BATCH: DSF044W DSF044W DSF044W
CALIB. REF: LF30022A LF30022A LF30022A

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SPIKE AMT (mg/L)	MS RSLT (mg/L)	MS % REC	SPIKE AMT (mg/L)	MSD RSLT (mg/L)	MSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Diesel	.273	5	4.23	79	4.75	3.91	77	3	65-135	35

SURROGATE PARAMETER	SPIKE AMT (mg/L)	MS RSLT (mg/L)	MS % REC	SPIKE AMT (mg/L)	MSD RSLT (mg/L)	MSD % REC	QC LIMIT (%)
Hexacosane	.25	.272	109	.238	.253	107	65-135

microbialinsights

2340 Stock Creek Blvd.
Rockford TN 37853-3044
Phone: (865) 573-8188
Fax: (865) 573-8133
Email: info@microbe.com

Culture Analysis Report

Client: Nick Weinberger
Tetra Tech , Inc.
1940 East Deere Ave
Suite 200
Santa Ana, CA 92705

Phone: (949) 756-7588

Fax: (949) 756-7583

MI Identifier: 066DF **Date Rec:** 06/29/2006 **Report Date:** 07/06/2006

Client Project #: 2973.0100 **Client Project Name:** Camp Pendleton

Purchase Order #: TBD

Analysis Requested: Plate Count, Chain of Custody

Comments:

All samples within this data package were analyzed under U.S. EPA Good Laboratory Practice Standards: Toxic Substances Control Act (40 CFR part 790). All samples were processed according to standard operating procedures. Test results submitted in this data package meet the quality assurance requirements established by Microbial Insights, Inc.

Reported By: Lora M Ogle

Reviewed By: Anita Biernacki

MICROBIAL INSIGHTS, INC.
2340 Stock Creek Blvd. Rockford, TN 37853-3044
Tel: (865) 573-8188; Fax: (865) 573-8133

CULTURE REPORT

Client: **Tetra Tech , Inc.**
Project: Camp Pendleton

MI Project Number: **066DF**
Date Received: 06/29/2006

Sample Information

Client Sample ID:	**10-14121-40**
Sample Date:	06/28/2006

Bacterial Group

Aerobic Heterotrophs	**9215m**	**cfu/mL**	**1.12E+04**
95% LL		*cfu/mL*	*1.07E+04*
95% UL		*cfu/mL*	*1.16E+04*

Contaminant Utilizing

Diesel Oxidizing Bacteria	**9215m**	**cfu/mL**	**6.55E+02**
95% LL		*cfu/mL*	*6.45E+02*
95% UL		*cfu/mL*	*6.65E+02*

Legend:
NA = Not Analyzed NS = Not Sampled LL = 95% confidence lower limit UL = 95% confidence upper limit NG = no growth

TETRA TECH
1230 Columbia Street, Suite 500
San Diego, CA 92101 (619) 234-8696

NUMBER 20011

CHAIN-OF-CUSTODY RECORD

PROJECT NAME: Camp Pendleton	PURCHASE ORDER NO: TBD
PROJECT LOCATION: UST Site 1412	PROJECT NO: 297.3.0100
SAMPLER NAME: Wendy Bryant	AIRBILL NUMBER: Fedex
PROJECT CONTACT: Nick Weinberger	PROJECT CONTACT PHONE NUMBER:

SAMPLE ID	DATE COLLECTED	TIME COLLECTED	NO. OF CONTAINER	LEVEL 3	LEVEL 4	TYPE	TAT
ID-1412I-40	6/28/06	1251	2	X		W	

ANALYSES REQUIRED: Total Hydrocarbons as Pentacosane (X); Total diesel degraders (X)

LABORATORY NAME: Microbial Insights

LABORATORY ID (FOR LABORATORY):

COMMENTS: B.c.I — Fed Ex

Sample(s) Received: 06/29/06 Time: 10:20 a.m.

COC sent: (Y) N Bottle ID match: (Y) N

Temp.: 1°C All intact? 1L/plastic

No. of damaged/missing samples: —

Sample Analyses Requested

(CUL) DNA IAQ PLFA VFA Other: _____

Set #: 066DF Signed: Brian C Jacobs

Use previous pricing in P.O.

RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
COMPANY: TtE	TIME: 5pm	COMPANY: FedEx
RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
COMPANY	TIME	COMPANY: MI
RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
COMPANY	TIME	COMPANY

COMPOSITE DESCRIPTION

SAMPLE CONDITION UPON RECEIPT (FOR LABORATORY)
TEMPERATURE: _____ SAMPLE CONDITION: ☐ INTACT ☐ BROKEN
COOLER SEAL: ☐ INTACT ☐ BROKEN

White - Laboratory; Pink - Laboratory; Canary - Project File; Manila - Data Management